Development of a Pollution Prevention and Energy Efficiency Clearinghouse for Biomedical Research Facilities

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This is the report of the National Association of Physicians for the Environment Committee on Development of a Pollution Prevention and Energy Efficiency Clearinghouse for Biomedical Research Facilities from the Leadership Conference on Biomedical Research and the Environment held at the National Institutes of Health in Bethesda, Maryland, on 1–2 November 1999. A major goal of the conference was the establishment of a World Wide Web-based clearinghouse, which would lend tremendous resources to the biomedical research community by providing access to a database of peer-reviewed articles and references dealing with a host of aspects of biomedical research relating to energy efficiency, pollution prevention, and waste reduction. A temporary website has been established with the assistance of the U.S. Environmental Protection Agency (EPA) Regions III and IV, where a pilot site provides access to the EPA's existing databases on these topics. A system of peer review for articles and promising techniques still must be developed, but a glimpse of topics and search engines is available for comment and review on the EPA Region IV-supported website (*http://wrrc.p2pays.org/*). *Key words:* biomedical research facilities, clearinghouse, energy efficiency, laboratory, pollution prevention. — *Environ Health Perspect* 108(suppl 6):949–951 (2000).
http://ehpnet1.niehs.nih.gov/docs/2000/suppl-6/949-951barker/abstract.html

On 1–2 November 1999 in Bethesda Maryland, the National Association of Physicians for the Environment (NAPE), the Association of Higher Education Facilities Officers (APPA), and the National Institute of Environmental Health Sciences (NIEHS) convened a Leadership Conference on Biomedical Research and the Environment at the National Institutes of Health. Conference goals included the development of a national information and education program and a World Wide Web-based clearinghouse to disseminate "best practices" for an environmentally sound biomedical research enterprise. This report describes the recommendations from the conference for the creation of such a clearinghouse.

The planned Pollution Prevention and Energy Efficiency Clearinghouse will be a World Wide Web resource to disseminate and exchange state-of-the-art pollution prevention, energy efficiency, and waste minimization information among all stakeholders in biomedical research in a timely, easily accessible manner. It will maintain awareness and continuing communication among diverse professions concerned with the impact of biomedical research facilities and activities on the environment. Target audiences for the information at the clearinghouse website include biomedical researchers; management and administrative staff at biomedical research facilities; specialists in research facilities design, construction, and maintenance; and community members concerned about the impact of biomedical research on the environment.

The biomedical research enterprise is a large industry in the United States, yet it does not have a clearinghouse for pollution prevention and energy efficiency information that addresses the special needs of biomedical research facilities. Addressing environmental concerns at these facilities requires access to a unique knowledge base compiled from diverse disciplines.

The clearinghouse proposed at the NAPE conference will have several unique features that distinguish it from the hundreds of clearinghouses currently in operation in the fields of pollution prevention and energy efficiency. First and foremost, the clearinghouse focus will be on biomedical research facilities, and it will bring together all the highly diverse environmental aspects of the design and operation of these specialized facilities—from energy efficiency to waste minimization—at a single site. It will also provide a repository of guidance on best practices for specific biomedical research techniques. Information on such best practices for application in research and medicine will often require highly specialized validation.

Based on the hierarchy of methods that provide the greatest protection of the environment, source reduction of wastes and pollutants is the highest priority for pollution prevention. In biomedical research facilities, source reduction practices must be brought to the laboratory and the clinic. However, biomedical researchers currently cannot easily find reliable information on source reduction techniques. This is just one example of an unmet need, so this proposed function of the clearinghouse is truly innovative. The clearinghouse will also help facilities meet various governmental mandates that relate to protection of the environment.

Development Issues

Currently there are new and "greener" designs, operating procedures, research techniques, and waste minimization strategies being discovered in many laboratories and facilities but that are not being applied in others, as communication of this information and technology is poor. The associated cost to biomedical research in dollars, lost time, and wasted resources is not easy to measure, but it is probably large. Through rapid updating and transfer of relevant new pollution prevention and energy efficiency technology, the clearinghouse will make it possible to avoid lost opportunities to reduce adverse environmental impacts and to avoid wasted resources spent reinventing and validating already existing technology.

In considering the clearinghouse proposal for the conference, a number of development issues were identified, including *a*) need for a clearinghous, *b*) feasibility and cost, *c*) potential developer/administrator, *d*) potential users, *e*) desired/needed information content and format, *f*) validation and quality control of information, and *g*) ease of access and usability of information.

It is clearly feasible to gather information and make it available on a website. Building and maintaining a clearinghouse that is both useful and used and contains only current validated information trusted by biomedical researchers is a formidable task. A process for

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Appendix. Members of NAPE Committee on Development of a Pollution Prevention and Energy Efficiency Clearinghouse for Biomedical Research Facilities.

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peer review and oversight will be needed to ensure quality of the information and inspire confidence in the clearinghouse as an authoritative source of such information. It will also be necessary to determine content that requires review and that which does not. For example, links to other sites and informal answers to questions posed on a bulletin board may not require peer review. Other content such as listings of best practices for research techniques, building design specifications, and laboratory animal and medical procedures will require a high level of scrutiny and validation.

Composition of peer review groups is critical to ensure that the best practices disseminated by the clearinghouse and flagged as reviewed and approved meet the needs of researchers and also satisfy regulatory requirements. In view of the wide variety and complexity of subjects to be covered, it will be necessary to vary the makeup of peer-review groups with content areas. Committees assembled for the 1999 conference represent an excellent starting place for locating and recommending qualified persons to serve on peer-review groups.

A few examples of special biomedical research information needs that the proposed clearinghouse can address include *a*) laws and regulations applicable to biomedical research facilities; *b*) biological (infectious agents) decontamination and disposal; *c*) community and media relations; *d*) facility design and siting; *e*) reagents/research procedures for pollution prevention and waste minimization; *f*) handling of biohazardous agents; *g*) multihazardous wastes; *h*) pharmaceuticals and intermediates; *i*) medical wastes—general information and reviews, regulatory issues, animal carcasses and tissues (source reduction methods, disposal methods,) regulated medical wastes (source reduction methods, recycling, inactivation, incineration and incineration, alternatives, disposal). Examples of the search engine, reference and literature topics can be accessed on the pilot Internet page listed on the U.S. Environmental Protection Agency (EPA) websites (*1,2*).

Areas Needing Additional Input

The following areas needing input as the clearinghouse is developed were identified and discussed at the 1999 conference: *a*) defining users and user needs; *b*) priorities for development of content; *c*) nature of entity to operate the clearinghouse; *d*) funding of development and operations; *e*) recommendations on composition and operations of peer-review groups; *f*) quality control criteria; and *g*) experience from other clearinghouses—lessons learned.

An ongoing survey of related clearinghouses can locate and report on active pollution prevention and energy efficiency clearinghouses covering other industry sectors with similar needs. This experience of other clearinghouses will provide information about operations and attributes of successful clearinghouses. To avoid duplication, it will also be important to function through links with other clearinghouses where subject matter of interest to the biomedical research community is covered.

A number of the web design and operation features of a Pollution Prevention and Energy Efficiency Clearinghouse for Biomedical Research Facilities discussed at the conference included *a*) focus of content will be on matters specifically applicable to biomedical research facilities; *b*) other useful environmental protection information of a

more general nature will be available by links to other sites; *c*) information content will be layered from general to specific; *d*) a search engine will assist users in finding references by key word search; *e*) a bulletin board will provide users a place to post questions, exchange information, and locate contacts; *f*) information validated for critical medical and research applications, including available published references, will be identified; and *g*) computerized search strategies will be used to generate, collect, and catalog information.

Electronic Internet Platform

The Waste Reduction Resource Center of the EPA Region IV has offered to provide Internet and database resources to enable a pilot clearinghouse. This resource makes thousands of existing documents available to the clearinghouse, most of which can be downloaded in the Adobe's System Acrobat PDF (portable document format) format (*2*) or ordered directly from EPA. Current staffing requirements of the Biomedical Research Facilities Clearinghouse are within the capabilities of the Waste Reduction Resource Center, and the center is providing the electronic platform and database access on the EPA Region IV-sponsored website (*3*).

Conclusion

The general conclusion reached at the conference was that the development of a Pollution Prevention and Energy Efficiency Clearinghouse for Biomedical Research Facilities is feasible and will provide an important mechanism to provide access to "green" research techniques and practices. The EPA, NIEHS, and APPA, as well as NAPE and other collaborating agencies, recognize the value of this resource and have lent strong support. The collaborating agencies will need to focus next on establishing the mechanism for peer review and approval of additional articles to be included in the existing database.

References and Notes

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